INSTITUTE OF GENETICS AND SELECTION OF MICROORGANISMS (MOSCOW)

(Currently in the Atomic Energy Commission - A new Institute under construction to be occupied in about one year.)

DIRECTOR: Dr. S. I. Alikhanian

500 workers in 24 laboratories

Main Groups:

Genetics of industrial microorganism

Molecular genetics

Chemistry

Biochemistry

Biophysics

Biopolymers

The main purpose of this Institute is to study

a. fundamental and applied problems

b. meet the demands of the industrial sector

c. study genetics as applied to molecular biology (productive strains)

amino acid production

enzymes - cellulase, and proteases

antibiotics

vitamins (especially B_{12})

The organisms under investigation in this Institute are:

B. subtilis

E. coli

Actinomycetes

Actinophages

phages T_4 and

yeasts: S. cerivisseas, Candida

The Specific Projects are:

1. Actinomycetes and Actinophages

   Recombination in Actinomycetes special interest in tetracyctine

   Transduction

They have the first gentic way for phage attachment. Prophage not as yet mapped. They presently have a lysogenic strain which provides a good model system.

2. Bacteriaphage T_4

   Studies on mechanism of suppression and nonsense mutation.

   Hope this will be useful for industrial micro-organisms.

3. Molecular genetics

   Studies on mutagenes on T_4 phage. Regulation of recombination

   Effect of neighboring nucleotide or mutagenesis

4. Bacterial genetics in E. coli

   Studies on regulatory mechanisms (especially thymine regulation)

   Concentration on deoxynucleoside operon

   Catabolic effects for thymidine phosphotas, aldolase, deoxyribose 5' phosphatase, phosphodeoxymutase, but no effect on thymidine kinase.

   Results are similar to those published by Prichard(England)

   Overall interest - integration of control processes.

5. Genetic Engineering

   Model system is T_4 phage.

   Studies with conditional lethal mutants. In course of these experiments have found several new genes. (R, star 1, 2, 3).

5. (cont'd)

Star 3 similar to gene described by Dr. Josilith. Interested in getting integration of bacterial DNA into phage. For example, wish to put penicillinase gene of B. subilitis into E. coli.

6. Fungi and yeast

Radiobiology study - effect of ionizing radiation to study ploidy. Apply to industrial strains. Newly organized unit - currently collecting strains. Wish to study hydrocarbon utilization - and its genetic control. Later to study Aspergillus. This group was not very impressive.

7. Biochemical Genetics

Study of recombination in B. subtilis (as initiated by Dr. Clark in California). Selection of mutants with changes in enzyme level. Have mapped ATP dependent DNA one. Now searching for specific transducing phages.

8. Amino Acid producing strains.

Selecting mutants and physiological conditions

Brevibacterium

Corynibacterium

B. subtilis

E. coli

Transformation, phage transductive, and mutant selection (nitrosoguanidine) attempted in Corynibacterium. Concluded sysine, tryptophane isolensime, glutamic acid are not economical for synthesis - objects for study.

Auxilary group in Armenian found in coryni-bacterium

8. (cont'd)

B. thuringenis

9. Exoenzymes

Aspergillus - acid protease

Trichederma - cellulase

B. subtilis - serine protease

Pseudomonas - lipase

Attempting to improve production.

[redacted] 25X1

[redacted] STAT